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The study of tar oxidation process kinetics of paraffin naphthenic base with activating complex

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Abstract

Bitumen is a mixture of hydrocarbons and hetero-organic compounds of different structures with a complex chemical composition which conditioning its operational physico-chemical and mechanical properties. Also varying widely depending on the nature of bituminous materials and the technology of its processing. The tar of oil mixture from Romashkinsky and Kama region deposits owned by OJSC "Tatneft" was chosen as the raw material of the oxidation process. During the oxidation of heavy petroleum residues (HPR) a lot of reactions takes place simultaneously: Dehydrogenation, dealkylation, oxidative polymerization, polycondensation, cracking, followed by "compaction" of its products caused by an increasing loss of hydrogen during oxidation, which in combination with the cyclization reactions leads to the formation of high molecular weight products of high aromaticity degree. Nowadays, the oxidation of heavy refinery residues by air is the main process of bitumen production in Russia. Various methods of oxidation process efficiency increase are developed, in particular, the increase of phase contact surface by improving the air supply devices, technological process optimization parameters, and the use of oxidation catalysts are known. The most promising area of oxidized bitumen production intensification and their quality improvement is the introduction to the oxidation process of various modifiers that change the dispersion state and the feedstock reactivity.

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Keywords

Adhesion - strength properties, Adjuvants, Bitumen, Composition, Heavy oil residues, Intensification, Oxidation, Physical-chemical properties